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USE OF MAGNETIC SLABS FOR BRACING PARTS BEING FINISHED ON A MILLING MACHINE

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Until now, in the USSR and abroad magnetic slabs for bracing parts being finished were used on polishing machines and, in rare cases, on turning lathes and planers. They were not, however, used for this purpose on milling machines.

The usual objections against them had been as follows:

1. The strength of the magnetic field was not sufficient to hold the parts during milling.

2. The magnetic field would affect the miller, spindle, and other parts of the machine.

3. A chip might be attracted to the cutting edge and consequently the tool would not cut metal.

The author of this article has proved that these objections are groundless. After introducing his suggestion in an assembly machine shop engaged in unit production of internal combustion engines, the author made use of a magnetic slab already in the shop, 1,500 x 450 millimeters in size, and an idle surface grinding machine, placing it on the table of a Zbroyëko vertical milling machine.

For the direct current supplied to the magnetic slab, the author used a shop generator of 380 volts AC and a 125-volt dynamo. To the slab faces, cutting edges about 50 millimeters high were attached with iron strips.

Perforations were cut in the cutting edge as outlets for the cooling liquids.

For a simpler method of holding the fine parts on the clean slab, lengthwise and crosswise strips must be set up. These strips are not needed for large parts.

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The number of parts which can be finished simultaneously depends on the thickness of the slab. The difference between the size of semifinished parts or parts which have had a preliminary finish should not exceed ± 0.5 millimeters for fine parts and ± 1 millimeter for large parts. A greater difference produces jerks at the beginning of milling and displaces the parts on the slab. If simultaneous finishing is absolutely necessary, long semifinished parts should be grouped at the edges of the slab and fine ones in the middle.

In conducting his first experiments, the author used a miller 130 millimeters in diameter to mill the parts with a cutting velocity of 49 meters per minute at the beginning and end of milling.

At present, for an average range of parts, the cutting velocity has been increased to 113 meters per minute and the work is done by an assembly miller 300 millimeters in diameter. The delivery per minute is 12 millimeters per minute for the starting and finishing range and 18 millimeters per minute for the middle range.

Such an obviously low cutting schedule must be explained by the absence of tool economy in the plant mentioned and the necessity for increasing the durability of the miller to the detriment of production of finishing work.

When the work is finished, the slab must be carefully cleaned of chips and the liquid must be cooled. It is advisable that the semifinished parts should be clean; that is, it should be without skin, casting earth, etc.

After stacking up the parts and connecting the magnetic slab, it is recommended to press the parts being finished to the slab surface by a tap of a nonferrous hammer.

In the author's opinion, the experiments conducted demonstrate the possibility of introducing magnetic slabs to brace parts which are to be milled.

It seems opportune to bring up the question of manufacturing magnetic slabs and plates for bracing parts supplying them for milling machines on the same basis as other ordinary accessories.

[One photograph and one schematic diagram of the machine are omitted but are available in the original document in CIA.]

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